

Appl. No. : 10/728,103
Filed : December 4, 2003

REMARKS

The November 1, 2004 Office Action was based upon pending Claims 1-22, 43, and 44. This Amendment amends Claims 1-5, 7, 8, 10-13, 15, and 16. After entry of this Amendment, Claims 1-22, 43, and 44 remain pending and are presented for further consideration.

Drawings

The drawings are objected to because the drawings contain hand-written reference numbers and phrases. To address the Examiner's concern, a substitute set of formal drawings is being submitted herewith. These formal drawings do not include hand-written reference numbers and phrases.

Additionally, Applicants have amended the drawings. In particular, in Figure 4, the reference numeral 12 is replaced with the reference number 40. The structure corresponding to reference numeral 12 is shown in Figure 1. No new matter is therefore added.

Dashed lines extending from the bracket associated with reference numeral 28 are also added. The structure corresponding to reference numeral 28 is shown in Figure 2. Accordingly, no new matter is added.

Similarly, in Figures 5, 6, and 9, a bracket and dashed lines extending from an arrow associate with reference numeral 28 is added. As discussed above, the structure corresponding to reference numeral 28 is shown in Figure 2, and thus, no new matter is added.

Objection to the Claims

Claim 1 is objected to because of informalities. In particular, Claim 1 appears to have an extra comma. Claim 1 has been amended to remove the comma between the words "first" and "upper."

Rejection under 35 U.S.C. §112, First Paragraph

Claims 14-15 and 22 rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.

The Office Action states that the claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, with regard to

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Claim 14, the Office Action states that the Examiner does not understand the limitation forming grading layers between the lower subcell and the middle subcell by growing InGaAs semiconductor material. The Office Action further states that it is impossible to grow a plurality of grading layers by using a single growing process with InGaAs semiconductor material. A similar concern is raised with regard to Claims 15 and 22.

The specification does describe how a graded composition may be formed. See for example paragraph [0049] on page 15, which includes a specific example of grading layers of $\text{In}_x\text{Ga}_{1-x}\text{As}$, with the content of In varying, e.g., x varying from about 0.01 to 0.3 or 0.3 to 0.6. Those skilled in the art will know from the disclosure how to fabricate such a graded composition by varying the amounts of the constituents over time during the growth process. Applicants therefore respectfully request that the rejection of Claims 14, 15, and 22 under 35 U.S.C. §112, first paragraph, be withdrawn.

Rejection under 35 U.S.C. §112, Second Paragraph

Claims 1-22 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

The Office Action states that in Claims 1-5, the phrase “said growth substrate” lacks antecedent basis. Claims 1-5 have therefore been amended to replace reference to “said growth substrate” with “said growth semiconductor substrate” as recommended by the Examiner.

The Office Action states that in Claims 7 and 8, the phrase “thin sheet” is subjective and indefinite. The word “thin” has therefore been removed from Claims 7 and 8. Additionally, the Office Action states that the phrase “high reflectance” in Claim 8 is subjective and indefinite. The phrase “high reflectance” has therefore been replaced with the phrase “increased reflectance.”

The Office Action states that in Claims 10-13 and 15, “ $\text{Ga}_x\text{In}_{1-x}\text{P}$ ”, “ $\text{In}_y\text{Ga}_{1-y}\text{As}$ ”, and “ $\text{Si}(x)\text{Ge}(1-x)$ ” are indefinite because Applicants fail to define the value of “x” and/or “y”. Accordingly, Applicants have amended Claim 10-13 and 15 by replacing “ $\text{Ga}_x\text{In}_{1-x}\text{P}$ ” with the phrase “gallium indium phosphide,” by replacing “ $\text{In}_y\text{Ga}_{1-y}\text{As}$ ” with “indium gallium arsenide,” and by replacing “ $\text{Si}(x)\text{Ge}(1-x)$ ” with “silicon germanium.”

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The Office Action states that in Claim 16, the phrase "said top subcell" lacks antecedent basis. Accordingly, Applicants have amended "said top subcell" to read "said upper subcell."

Applicants therefore respectfully request that the rejection of Claims 1-22 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention, be withdrawn.

Allowable Subject Matter

Claim 1 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, second paragraph. Claims 2-13 and 16-21 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph, and to include all of the limitations of the base claims and any intervening claims. Claims 43-44 are allowed.

As described above, Claim 1, as amended, overcomes the rejections under 35 U.S.C. 112, second paragraph. Applicants therefore respectfully request the allowance of Claim 1 as well as amended Claims 2-22, which depend therefrom.

Comments on Statement of Reasons for the Indication of Allowable Subject Matter

The Office Action presents a statement of reasons for the indication of allowable subject matter. The Office Action states that the prior art fails to disclose the step of providing a support structure over the lower subcell having a lower band gap and removing the growth semiconductor substrate in conjunction with all other limitations in the claim.

Applicants wish to point out that the claims are patentable based on the combination of elements recited therein and not on any particular feature. Accordingly, to the extent that the Office Action omits claims limitations, including the exclusion of reference to dependent claims, Applicants respectfully disagree with the reasons set forth in the Office Action. Applicants further emphasize that for any particular claim only those limitations expressly recited in such claim are relevant to the reasons for its allowability. To the extent that the Examiner's characterization of the subject matter of the claims differs from the language of the claims, Applicants respectfully disagree with the reasons for indication of allowable subject matter.

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CONCLUSION

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested. If the Examiner has any questions regarding the foregoing, the Examiner is invited to contact the undersigned at the phone number listed below.

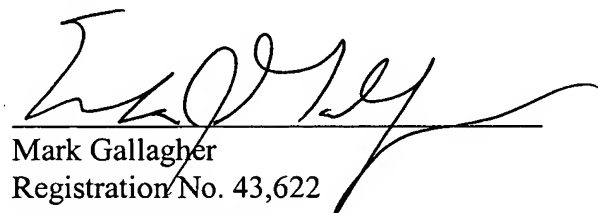
Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: _____

2/1/05

By: _____



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AMENDMENTS TO THE DRAWINGS

Please amend the drawings as set forth below. Replacement sheets of drawings as well as annotated marked-up drawings that reflect these amendments are being submitted herewith.

In Figure 4, please replace reference number 40 with reference numeral 12. Please also add dashed lines extending from the bracket associated with reference numeral 28.

In Figure 5, please add a bracket and dashed lines extending therefrom at the end of the arrow associated with reference numeral 28.

In Figure 6, please add a bracket and dashed lines extending therefrom at the end of the arrow associated with reference numeral 28.

In Figure 9, please add a bracket and dashed lines extending therefrom at the end of the arrow associated with reference numeral 28.



HIGH EFFICIENCY, MONOLITHIC MULTI-JUNCTION SOLAR CELLS CONTAINING
LATTICE-MISMATCHED MATERIALS AND METHODS OF FORMING SAME

Iles, et al.

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Atty Docket: BPINC.001A

Annotated Marked-Up Drawings

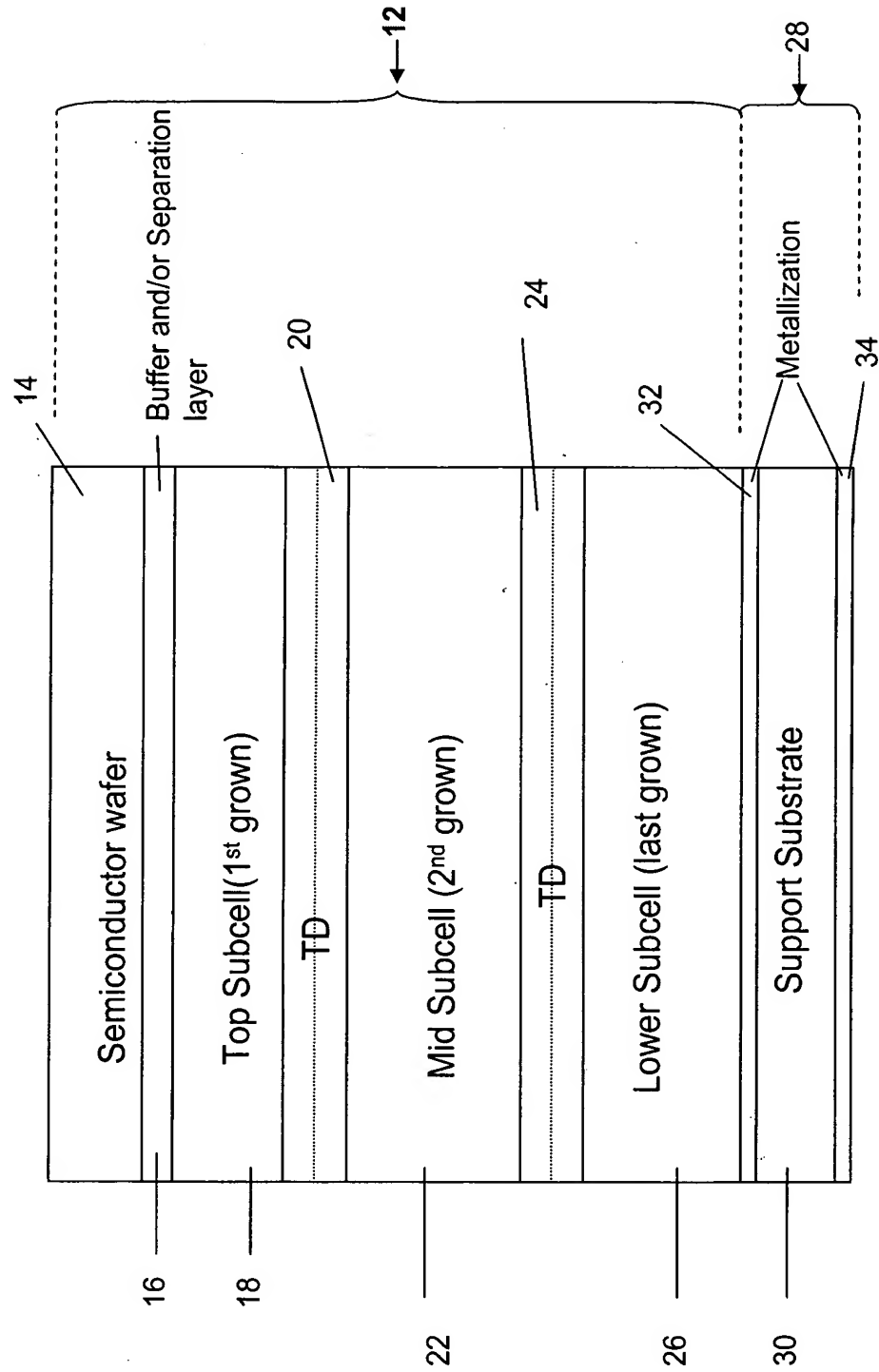


Figure 4.

Annotated Marked-Up Drawings

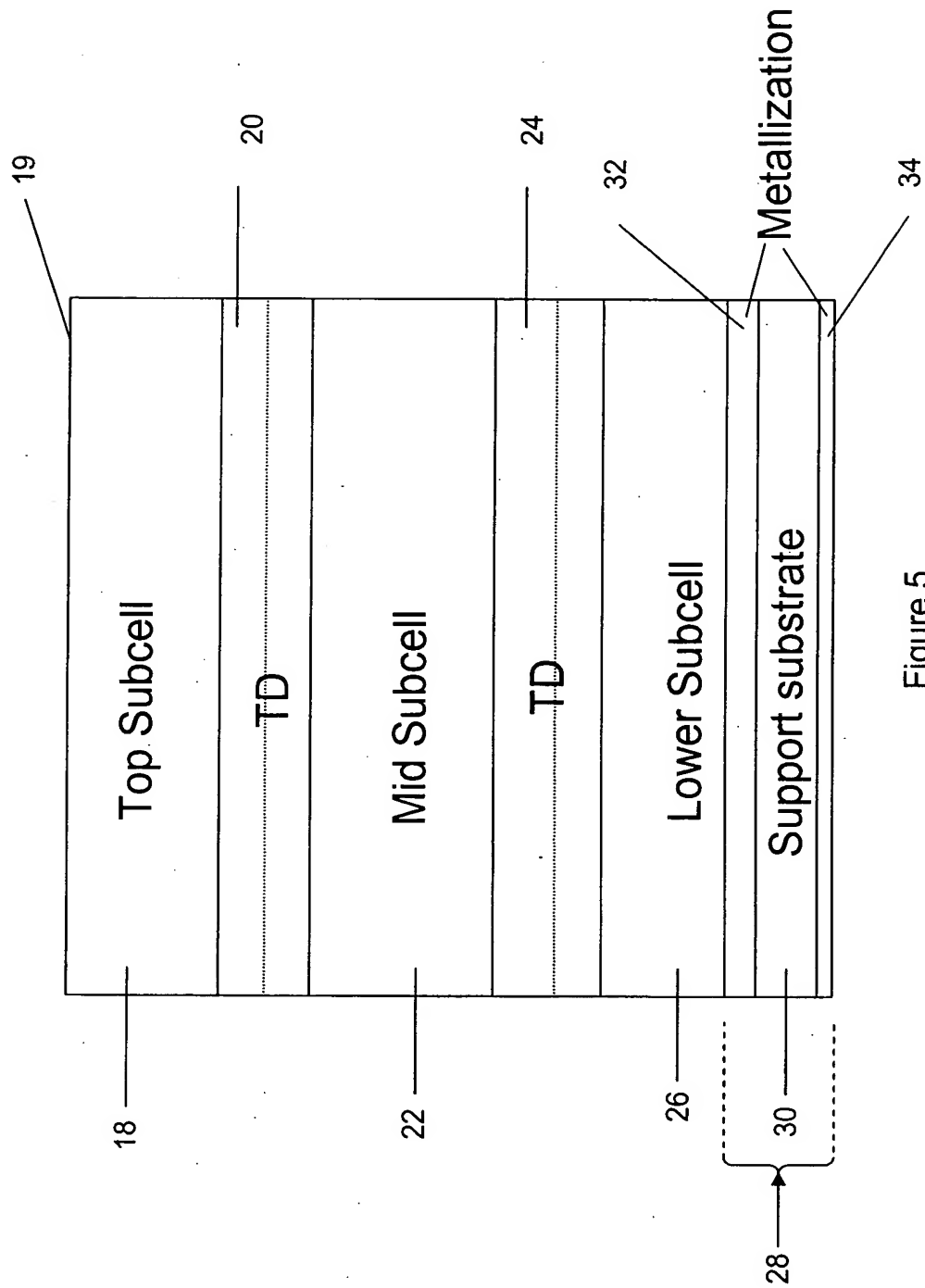


Figure 5.

Annotated Marked-Up Drawings

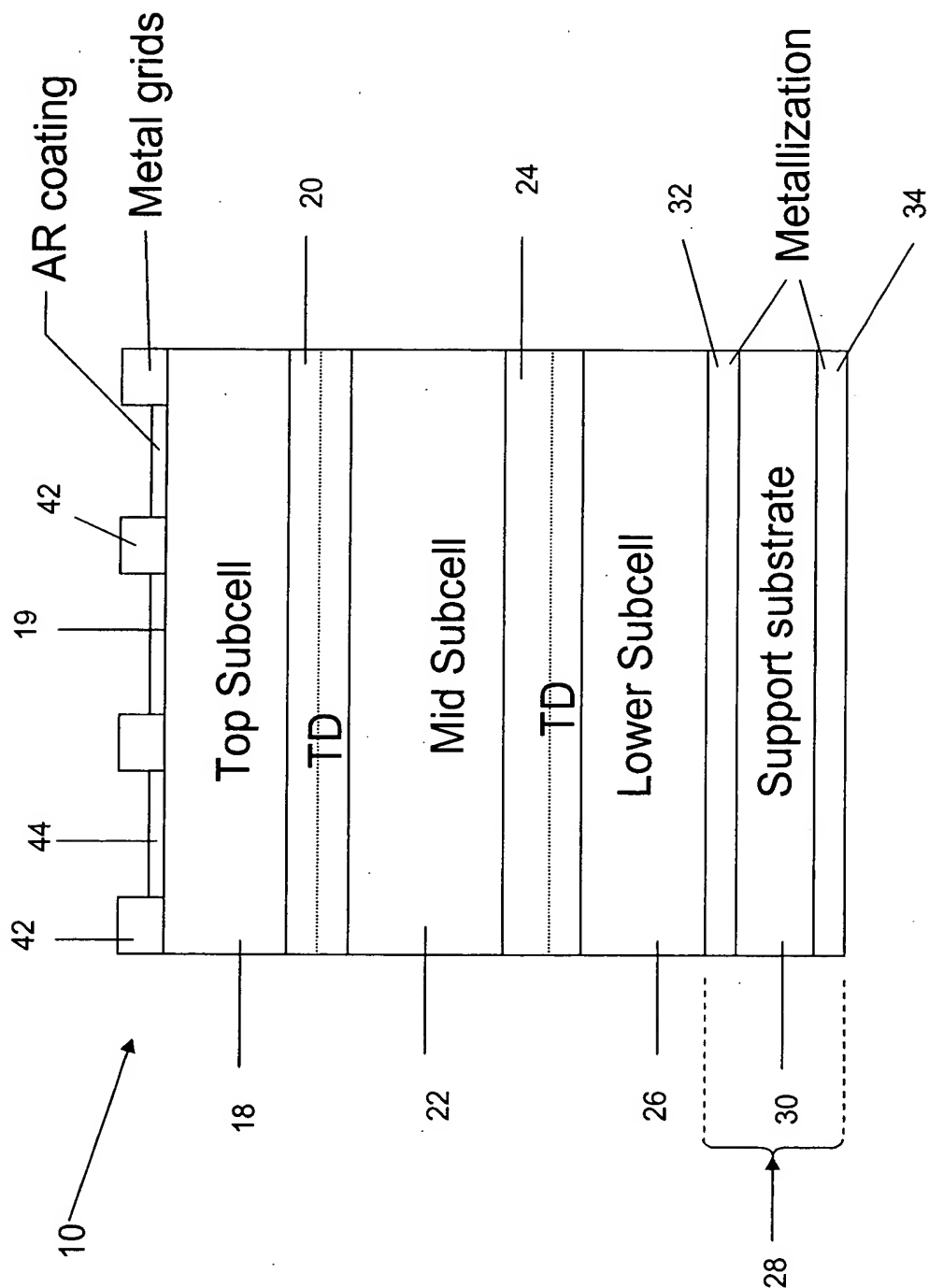


Figure 6.

Annotated Marked-Up Drawings

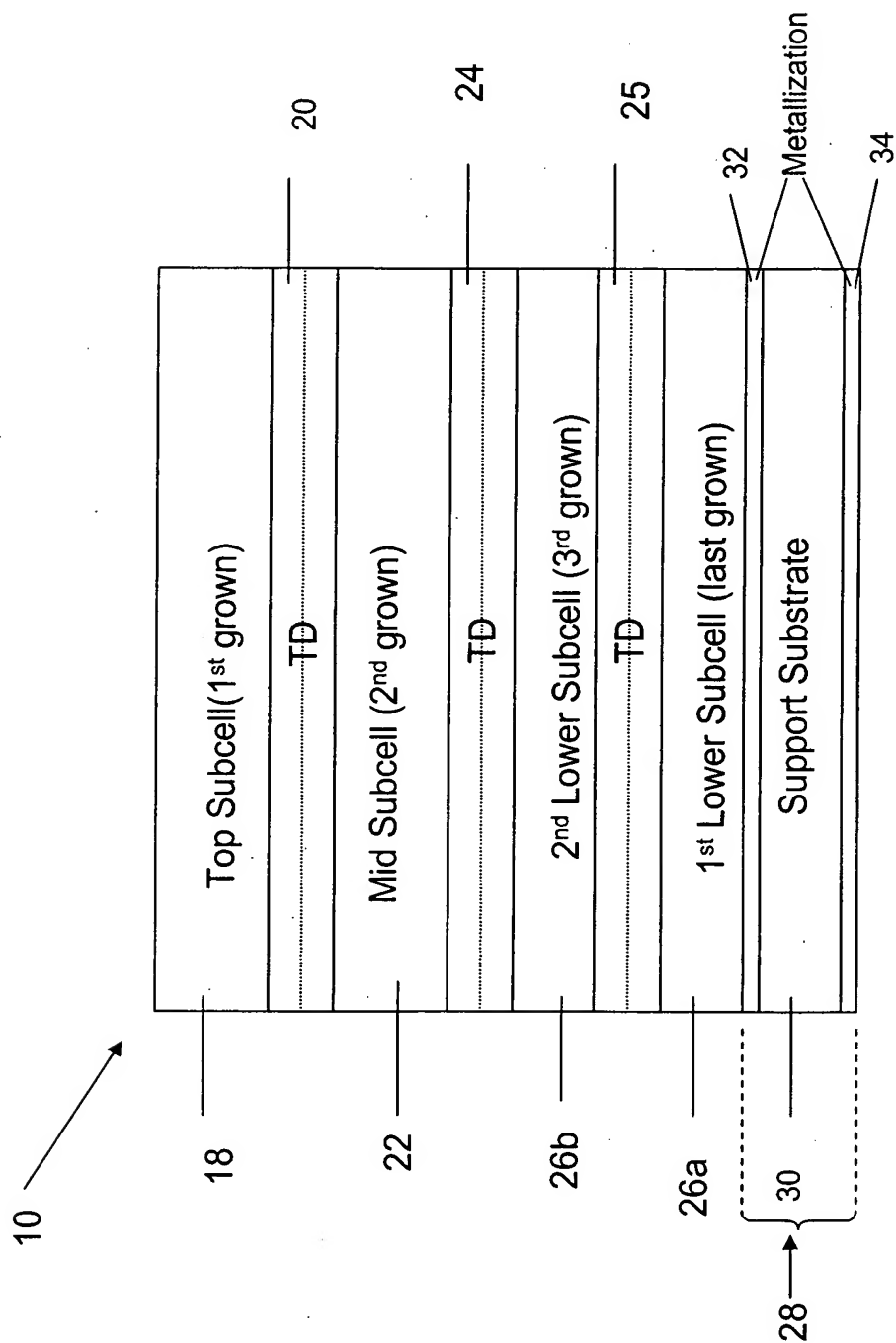


Figure 9.